

Discipline: Civil & Mechanical	Semester: 1st	Name of the teaching faculty: Anjali Kujur
Subject: Engg. Physics (Th.2a)	No. of days/week class allotted: 04	Semester from date: 25/10/2021 to date:31/01/2022 No. of weeks: 15
Week	Class Day	Theory Topics
1 st	1 st	Introduction to: Engg. Physics (Th-2a) and its syllabus, Question paper pattern and motivation
	2 nd	Unit-1: UNIT & DIMENSIONS Physical quantities, Units, types of units and system of units
	3 rd	Unit-1: UNIT & DIMENSIONS Dimension and dimensional formulae of physical quantities
	4 th	Unit-1: UNIT & DIMENSIONS Principle of homogeneity and application of dimensional analysis: Checking the correctness of physical relations and Numerical
2 nd	1 st	Unit-2: SCALARS AND VECTORS Concept of scalar and vector quantities with definition, types of vectors, Rules of vector addition: Statements of Triangle law of vector addition
	2 nd	Unit-2: SCALARS AND VECTORS Parallelogram law of vector addition and s
	3 rd	Unit-2: SCALARS AND VECTORS Vector multiplication: Dot product and Cross Product with simple numericals on dot and cross products
	4 th	Unit-3: KINEMATICS Concept of Rest and Motion with examples, Fundamental ideas on distance, displacement, speed, velocity, acceleration and force, equations of motion under gravity both for upward and downward motion
3 rd	1st	Unit-3: KINEMATICS Circular motion: Conceptual idea on circular motion and terms related to circular motion such as angular displacement, angular velocity and angular acceleration.
	2nd	Unit-3: KNEMATICS Derivations of Relation between- (i) Linear & angular velocity, (ii) Linear & Angular acceleration
	3 rd & 4 th	Unit-3: KINEMATICS Projectile motion: Definition and examples, Expression for equation of Trajectory, Time of Flight, Maximum Height and Horizontal Range for a projectile fired at an angel, condition for maximum horizontal range with simple numericals
4 th	1st	Unit-4: WORK AND FRICTION Definition of work, its formula and SI unit with simple numericals
	2 nd	Unit-4: WORK AND FRICTION Concept of friction with definition and simple examples, Types of friction

4 th	3 rd	Unit-4: WORK AND FRICTION Definition with concept on limiting friction, and laws of limiting friction (statement only)
	4 th	Unit-4: WORK AND FRICTION Theory on Coefficient of Friction and simple numericals
5 th	1 st	Unit-4: WORK AND FRICTION Methods to reduce friction with practical examples
	2 nd	Unit-5: GRAVITATION Introduction, a detail explanation on Newton's Laws of Gravitation
	3 rd & 4 th	Unit-5: GRAVITATION Definition of Universal Gravitational Constant (G) with its unit and dimensions, Definition and concept of acceleration due to gravity (g), Relation between 'g' and 'G' and definition of mass and weight
6 th	1 st & 2 nd	Unit-5: GRAVITATION Explanation (No derivation) on variation of 'g' with altitude and depth, statements on Kepler's Laws of Planetary motion
	3 rd & 4 th	Unit-6: OSCILLATIONS AND WAVES Definition and examples on Simple Harmonic Motion (SHM), expressions for displacement, velocity and acceleration of a body or particle in SHM
7 th	1 st & 2 nd	Unit-6: OSCILLATIONS AND WAVES Wave Motion (Definition & Concept), Transverse and Longitudinal wave motion (Definition, examples and Comparison)
	3 rd & 4 th	Unit-6: OSCILLATIONS AND WAVES Wave parameters and Establish a relation between velocity, frequency and Time period, Ultrasonics- Definition, properties & Applications
8 th	1 st	Unit-7: HEAT AND THERMODYNAMICS Heat & temperature-Definition and difference, Units of Heat (FPS, CGS, MKS & SI)
	2 nd & 3 rd	Unit-7: HEAT AND THERMODYNAMICS Fundamental ideas on Specific heat, Change of State and Latent Heat with simple numericals
	4 th &	Unit-7: HEAT AND THERMODYNAMICS Concept on Thermal expansion and Coefficient of linear (α), superficial (β) and cubical (γ) expansions of Solids, Relation between α , β and γ
9 th	1 st	Unit-7: HEAT AND THERMODYNAMICS Definition and Relation between Work and Heat, Joule's Mechanical Equivalent of Heat, Statement and explanation on 1 st law of thermodynamics
	2 nd & 3 rd	Unit-8: OPTICS Concept of Reflection and laws of Reflection, Concept of Refraction and laws of Refraction and Refractive index (Definition, formula and Simple numericals)
10 th	4 th &	Unit-8: OPTICS Concept of Reflection and laws of Reflection, Concept of Refraction and laws of Refraction and Refractive index (Definition, formula and Simple numericals)
	1 st	Unit-8: OPTICS Concept and Explanation of Total Internal Reflection and Critical angle
	2 nd	Unit-8: OPTICS Concept and Explanation of Total Internal Reflection and Critical angle

	3 rd	Unit-8: OPTICS Definition, Properties and Applications on Fibre Optics
	4 th	Unit-9: ELECTROSTATICS AND MAGNETOSTATICS Concept of Electric field and Electric field intensity, Statement and Explanation of Coulomb's law and definition of Unit charge, Absolute & Relative Permittivity (Definition, Relation & Unit)
11 th	1 st	Unit-9: ELECTROSTATICS & MAGNETOSTATICS definition of Unit charge, Absolute & Relative Permittivity (Definition, Relation & Unit),
	2 nd	Unit-9: ELECTROSTATICS & MAGNETOSTATICS Electric Field, Electric field intensity, Electric potential & Electric potential difference (Definition, formula & SI units), Concept of capacitor and capacitance,
	3 rd	Series and parallel combination of capacitors: Formula for equivalent capacitance and simple numericals
	4 th	Unit-9: ELECTROSTATICS & MAGNETOSTATICS Fundamental idea on magnet, Coulomb's law in magnetism and definition of Unit pole
12 th	1 st	Unit-9: ELECTROSTATICS & MAGNETOSTATICS Definition of magnetic field and Magnetic field Intensity (H) with its formula and SI unit,
	2 nd	Unit-9: ELECTROSTATICS & MAGNETOSTATICS Magnetic lines of force-Definition and Properties. Magnetic flux(ϕ) and Magnetic flux density (B)
	3 rd	Unit-10: CURRENT ELECTRICITY Introduction to electric current, Ohm's law and its applications
	4 th	Unit-10: CURRENT ELECTRICITY Series and parallel combination of resistors: Formula for equivalent resistance and
13 th	1 st	Unit-10: CURRENT ELECTRICITY Simple numericals on combination of resistors
	2 nd	Unit-10: CURRENT ELECTRICITY Kirchhoff's laws: Statements & Explanation with diagram
	3 rd	Unit-10: CURRENT ELECTRICITY Application of Kirchhoff's laws to Wheatstone bridge-Derivation of balance condition of Wheatstone bridge
	4 th &	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION
14 th	1 st	Introduction, Force acting on a current carrying conductor placed in a uniform magnetic field, Fleming's left hand rule
	2 nd	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION Statement on Faraday's Laws of Electromagnetic Induction & Lenz's law

14 th	3 rd	Unit-11: ELECTROMAGNETISM AND ELECTROMAGNETIC INDUCTION Fleming's Right Hand Rule, Comparison between Fleming's RHR & LHR
	4 th	Unit-12: MODERN PHYSICS Introduction to LASER and laser beam, characteristics of laser beam
15 th	1 st	Unit-12: MODERN PHYSICS LASER principle: Population inversion & Optical Pumping, Applications of Laser
	2 nd	Unit-12: MODERN PHYSICS Concept on Wireless Transmission- Ground waves, Sky waves & Space Waves
	3 rd	Revision & doubt clearing, Previous Year question answer discussion
	4 th	Practice Test